

What is claimed is:

1 1. A manufacturing method for an arc tube in which
2 a phosphor layer is formed on an inner surface of a bent
3 glass tube, comprising:

4 a formation process of turning a glass tube to form
5 a turning part therein, and winding the glass tube, from
6 the turning part to at least one end of the glass tube,
7 on a predetermined axis in a first direction, thereby forming
8 the bent glass tube;

9 a coating process of coating the inner surface of the
10 bent glass with a phosphor suspension; and

11 a preliminary drying process of drying the phosphor
12 suspension that coats the inner surface, while rotating
13 the bent glass tube on the axis in a second direction that
14 is opposite to the first direction, with the bent glass
15 tube in an inclined state such that the axis is inclined
16 with respect to a vertical direction.

1 2. The arc tube manufacturing method of Claim 1,
2 wherein

3 in the preliminary drying process, the suspension is
4 dried until the suspension no longer flows according to
5 self weight.

1 3. The arc tube manufacturing method of Claim 1,
2 wherein
3 in the preliminary drying process the bent glass tube
4 is inclined such that an angle between the axis and the
5 vertical direction is in a range of 45 degrees to 150 degrees
6 inclusive.

1 4. The arc tube manufacturing method of Claim 1,
2 wherein
3 the glass tube is wound, from the turning part to each
4 end, on the axis in the first direction, thereby forming
5 the bent glass tube having a double spiral shape.

1 5. The arc tube manufacturing method of Claim 4,
2 wherein
3 in the preliminary drying process the bent glass tube
4 is inclined such that an angle between the axis and the
5 vertical direction is in a range of 90 degrees to 150 degrees
6 inclusive.

1 6. The arc tube manufacturing method of Claim 1,
2 wherein
3 the suspension has a viscosity in a range of 3.0×10^{-3}

4 Pas to 5.0×10^{-3} Pas inclusive.

1 7. The arc tube manufacturing method of Claim 1,
2 wherein

3 the bent glass tube is rotated in a range of 2
4 rotations/min to 20 rotations/min inclusive.

1 8. The arc tube manufacturing method of Claim 1,
2 wherein

3 when the suspension is being injected into the bent
4 glass tube, a temperature of an outer surface of the glass
5 tube is in a range of 30°C to 60°C inclusive.

1 9. The arc tube manufacturing method of Claim 1,
2 wherein

3 a draining process is performed before the preliminary
4 drying process, the draining process being for draining
5 the suspension out from the bent glass tube through an end
6 part thereof by gravity.

1 10. The arc tube manufacturing method of Claim 9,
2 wherein

3 in the draining process the bent glass tube is rotated
4 at a speed in a range of 2 rotations/min to 20 rotations/

5 min, an axis of rotation being the spiral axis.

1 11. The arc tube manufacturing method of Claim 10,
2 wherein

3 in the draining process the bent glass tube is rotated
4 for at least 15 seconds and no more than 60 seconds from
5 when draining of the suspension is commenced.

1 12. The arc tube manufacturing method of Claim 10,
2 wherein

3 in the draining process the bent glass tube is rotated
4 inclined with respect to the vertical direction.

1 13. The arc tube manufacturing method of Claim 12,
2 wherein

3 the bent glass tube is inclined at an angle in a range
4 of 5 degrees to 90 degrees inclusive.

1 14. The arc tube manufacturing method of Claim 1,
2 wherein

3 the suspension is water based, and includes phosphor
4 for three bands.

1 15. The arc tube manufacturing method of Claim 1,

2 wherein
3 the suspension is butyl acetate based, and includes
4 phosphor for three bands.